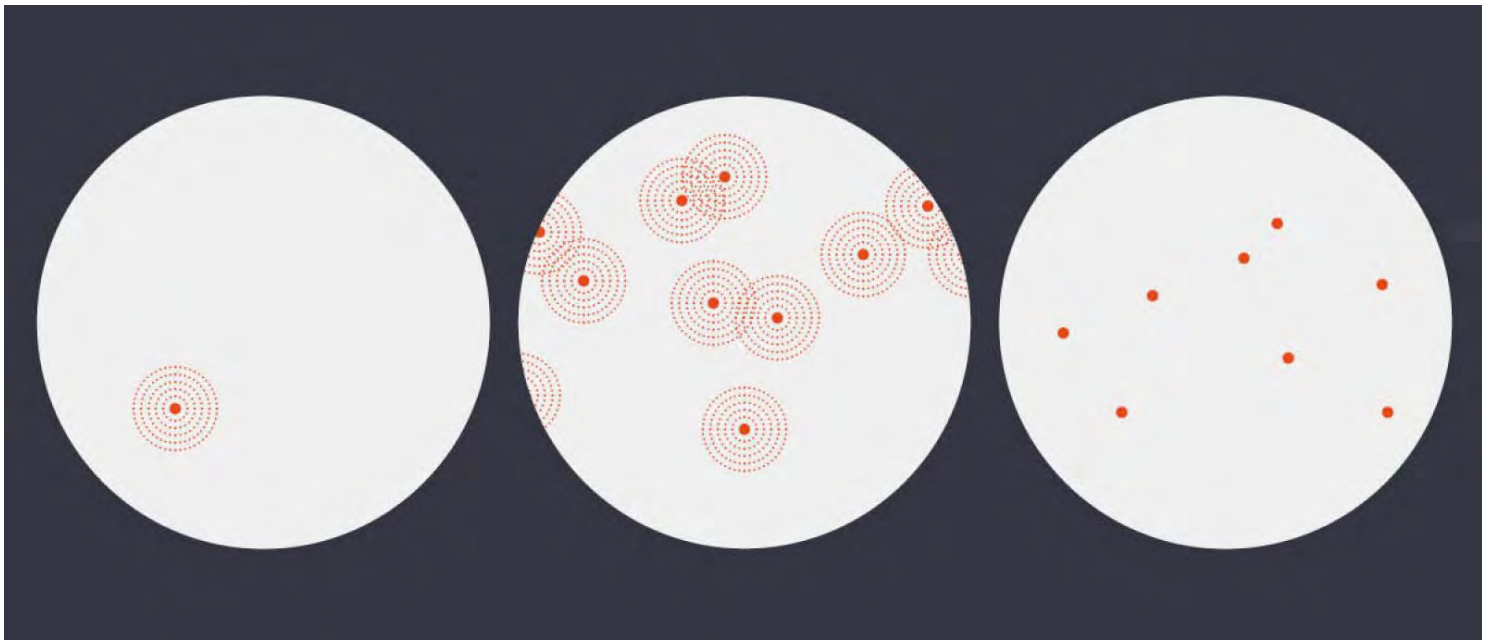
EXHIBIT 132



Epidemic, Endemic, Pandemic: What are the Differences?

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← News (/about-us/news)

The novel coronavirus pandemic is the perfect model for understanding what exactly a pandemic is and how it impacts life on a global scale. Since the emergence of COVID-19 in 2020, the public has been bombarded with new language to understand the virus and the subsequent global public health response. This article will uncover the factors that make a pandemic and how it differs from epidemics and when a disease is endemic.

What is an Epidemic?

The Centers for Disease Control and Prevention (CDC) (https://www.cdc.gov/csels/dsepd/ss1978/lesson1/section11.html) describes an epidemic as an unexpected increase in the number of disease cases in a specific geographical area. Yellow fever, smallpox, measles, and polio are prime examples of epidemics. An epidemic disease doesn't necessarily have to be contagious. West Nile fever and the rapid increase in obesity rates are also considered epidemics. Epidemics can refer to a disease or other specific health-related behavior (e.g., smoking) with rates that are clearly above the expected occurrence in a community or region.

What is a Pandemic?

The World Health Organization (WHO) (https://www.who.int/bulletin/volumes/89/7/11-088815/en/#:~:text=A%20pandemic%20is%20defined%20as,are%20not%20considered%20 declares a pandemic when a disease's growth is exponential. This means the growth rate skyrockets, and each day cases grow more than the day prior. In being declared a pandemic, the virus has nothing to do with virology, population immunity, or disease severity. It means a virus covers a wide area, affecting several countries and populations.

What does Endemic mean?

A disease outbreak is endemic when it is consistently present but limited to a particular region. This makes the disease spread and rates predictable. Malaria, for example, is considered endemic in certain countries and regions.

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What are the Differences Between Pandemics and Epidemics?

The WHO defines pandemics, epidemics, and endemic diseases based on a disease's rate of spread. Thus, the difference between an epidemic and a pandemic isn't in the severity of the disease, but the degree to which it has spread.

A pandemic cuts across international boundaries, as opposed to regional epidemics. This wide geographical reach is what makes pandemics lead to large-scale social disruption, economic loss, and general hardship. It's important to note that a once-declared epidemic can progress into pandemic status. While an epidemic is large, it is also generally contained or expected in its spread, while a pandemic is international and out of control.

Causes of Disease Outbreaks

Several factors contribute to the outbreak of infectious diseases. Contraction can occur as a result of transmission from people, animals, or even the environment. For example:

- Weather conditions. (https://www.who.int/globalchange/climate/en/chapter6.pdf) For example, whooping cough occurs in spring, whereas measles tend to appear in the winter season.
- Exposure to chemicals or radioactive materials. (https://www.who.int/teams/environment-climate-change-and-health/emergencies/disease-outbreaks) For example, Minamata is a disease contracted after exposure to mercury.
- The social aftermath of disasters (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2725828/) such as storms, earthquakes, and droughts can lead to high disease transmission.
- A number of environmental factors (https://www.who.int/teams/environment-climate-change-and-health/emergencies/disease-outbreaks) such as water supply, food, air quality, and sanitation facilities can catalyze the spread of infectious diseases.

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Disease origins (https://www.who.int/environmental_health_emergencies/disease_outbreaks/unknown_etic can also be unknown. These kinds of diseases could be caused by a variety of factors, including:

- A new or newly modified pathogen
- Natural toxins
- Undetected chemical releases
- Unknown ionizing radiation over-exposure

The field of epidemiology (/academics/departments/epidemiology) works to trace these unidentified outbreaks to the source in an effort to protect public health and safety.

Notable Past Pandemics

The current COVID-19 outbreak is not the only disease to have impacted the world on a global scale. Here are just a few examples of past pandemics that have shaped the evolution of outbreaks and human immunity:

The Black Death (1346 - 1353): (https://www.history.com/topics/middle-ages/black-death) The Black Death caused an estimated death of 25 million people across the world in the 14th century. According to scientists, the outbreak was caused by a bacteria called Yersinia pestis. This Bubonic Plague lasted for about four years.

American Plagues (16th Century): (https://www.livescience.com/worst-epidemics-and-pandemics-in-history.html) A cluster of Eurasian diseases brought to the Americas by European explorers, smallpox was one of the chief illnesses of the American Plagues, which contributed to the collapse of the Inca and Aztec civilizations. Some estimates suggest that 90 percent of the indigenous population in the Western Hemisphere was killed off as a result.

The Flu Pandemic (1889-1890): (https://www.livescience.com/worst-epidemics-and-pandemics-in-history.html)New transportation routes made possible in the Industrial Age made it easier for influenza viruses to spread widely in the U.S. and beyond. In the span of

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months, influenza traveled around the globe, with the earliest cases reported in Russia. The virus spread rapidly throughout St. Petersburg before quickly making its way through Europe and the rest of the world, despite the fact that air travel didn't exist yet, leaving 1 million people dead in its wake.

Spanish Flu (1918-1920): (https://www.cdc.gov/flu/pandemic-resources/1918-commemoration/1918-pandemic-history.htm)Another massive disease outbreak was the influenza pandemic, popularly called Spanish flu. This viral pandemic began in 1918, immediately following World War I. Over 50 million deaths were recorded during this outbreak, with the disease lasting only two years.

The Asian Flu (1957-1958): (https://www.livescience.com/worst-epidemics-and-pandemics-in-history.html) The Asian Flu pandemic, which was a blend of avian flu viruses, began in China and eventually claimed more than 1 million lives. The CDC notes that the rapidly-spreading disease was reported in Singapore in February 1957, Hong Kong in April 1957, and the coastal cities of the U.S. in the summer of 1957. The total death toll was more than 1.1 million worldwide, with 116,000 deaths nationally.

AIDS Pandemic and Epidemic (1981-present): (https://www.livescience.com/worst-epidemics-and-pandemics-in-history.html) Since it was first identified, AIDS has claimed an estimated 35 million lives. Scientists believe that HIV, the virus that causes AIDS, is likely to have evolved from a virus found in chimpanzees that was transferred to humans in West Africa in the 1920s. By the late 20th century, the virus had made its way around the world. For decades, the disease had no known cure, but medication developed in the 1990s now allows people with the disease to experience a normal life span with regular treatment.

"Explore More: Columbia Public Health faculty have led on every aspect of the global response to HIV, from research into mother-to-child transmission to strengthening treatment and care systems to the history of stigma, advocacy, and coalition-building."

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The Way Out

A common attribute of epidemics and pandemics is the need to take preventive care from infection. Typically, there is a large time lag between an outbreak and when vaccinations can be distributed, as we have seen with COVID-19. In the meantime, it's crucial to take the following steps to stay healthy:

- Wash your hands often with soap and water. Make use of hand sanitizer.
- Don't touch your mouth or nose without sanitizing or washing your hands.

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- When you cough or sneeze, cover your mouth and nose with a tissue.
- Avoid crowded places. Stay home if you can.
- Disinfect household surfaces regularly.
- Practice social distancing when you go out of the house.
- Employ properly fitted face masks and other protective shields when outside of your household.

Topics

Global Health (/public-health-now/topics/global-health), Infectious Disease (/public-health-now/topics/infectious-disease), Public Health Education (/public-health-now/topics/education)

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